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AFOEHL REPORT 89-085EQ0006HHB

HAZARDOUS WASTE TECHNICAL ASSISTANCE SURVEY ALTUS AFB OK

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JUNE 1989

Final Report

AF Occupational and Environmental Health Laboratory (AFSC)
Human Systems Division
Brooks Air Force Base, Texas 78235-5501

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At the request of 443 ABG/DEEV, AFOEHL personnel conducted a hazardous waste technical assistance survey at Altus AFB from 8 to 13 January 1989. The purpose of this survey was to address an Administrative Compliance Order issued by the Oklahoma State Department of Health on 26 July 1988. The scope of the survey included hazardous waste management practices, waste disposal practices, and waste minimization alternatives. The survey team performed a shop-by-shop evaluation of chemical waste management practices as well as met with hazardous waste managers and engineers to discuss the hazardous waste program. The results of our survey showed that Altus AFB has a workable hazardous waste program that needs further development. Keywords: hydraulic fluid; waste oil; waste fuels; contaminated soil;

Recommendations include: (1) Centralized aboveground tanks should be installed for the accumulation of waste oils, waste transmission and hydraulic fluids and waste fuels. (2) All accumulation sites should be secured, diked, covered and located on impermeable(over

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surfaces to prevent future problems. (3) The Pneudraulics Shop, AGE Shop, Transportation Shop, Propulsion Shop, Auto Hobby Shop and Refueling Maintenance Shop need to use secured, mobile waste bowsers to dispose and transport their waste oils and fluids. (4) A base waste analysis plan should be implemented to characterize wastestreams throughout the base as hazardous or nonhazardous. (5) Contaminated soil resulting from chemical spills at the AGE Shop and Transportation Shop outdoor satellite accumulation sites needs to be removed from the site and properly disposed of. (6) Refueling Maintenance Shop personnel should use catch pans for JP-4 fuel to reduce the large amounts of fuel currently entering the sanitary sewer. (7) Used rags currently being disposed of as a hazardous waste should be sent to linen exchange for cleaning and reuse. (8) To minimize the amount of solvents being disposed of through DRMO the base should consider contracting with a solvent leasing company. (9) Wet disposal of unserviceable batteries (similar to Auto Hobby Shop, Building 343) should be considered as an alternative to the current disposal method. (10) The Power Production Shop is discharging neutralized battery acid to the storm water system; the neutralized battery acid should be redirected to the sanitary sewer system.

ACKNOWLEDGMENTS

The author greatly appreciates the technical expertise and hard work provided by Maj Elliot Ng and Lt Nancy Hedgecock. I am especially grateful to Lt Hedgecock who helped finalize this technical report after my PCS. I would also like to thank Lt James Rypkema and all the personnel at Altus AFB for making us feel welcome in the gala state of Oklahoma.

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I. INTRODUCTION

On 15 August 1988, Headquarters 443d Air Base Group, Civil Engineering, Environmental Planning Section (HQ 443 ABG/DEEV) requested the Air Force Occupational and Environmental Health Laboratory, Consultant Services Division, Environmental Quality Branch (AFOEHL/ECQ) accomplish a hazardous waste technical assistance survey at Altus AFB. The survey was conducted to respond to an Administrative Compliance Order issued by the Oklahoma State Department of Health on 26 July 88. The scope of the survey focused on waste generation, disposal, analysis, management practices, and minimization. The survey was conducted from 8-13 January 89 by Maj Elliot K. Ng, 1Lt Anthony T. Zimmer and 2Lt Nancy S. Hedgecock.

II. BACKGROUND

A. Base Description

Altus AFB is located in southwestern Oklahoma approximately 60 miles west of Lawton, Oklahoma. The base is home of the 340th Military Airlift Wing and various tenant organizations including the 340th Air Refueling Wing, 2002nd Communications Squadron and 71st ACE Detachment. The primary mission of Altus AFB is to conduct C-141 and C-5 training for Military Airlift Command (MAC) aircrews (see Figure 1 for base map).

b. Hazardous Waste Program

As a result of an Administrative Compliance Order issued by the Oklahoma State Department of Health on 26 July 88, Altus AFB was required to develop a formal hazardous waste management program. Fourteen violations were stated in the compliance order (see Appendix A for details) which had corrective action suspenses ranging from 30 to 180 days and fines ranging from $900/day to $10,000/day. The base satisfactorily met the suspenses in the compliance order.

In the past, shops generating wastes did not keep written logs or segregate wastes for disposal. A common shop practice was to place waste oils, hydraulic fluids and solvents in the same bowser. As a result, numerous wastestreams throughout the base required chemical analyses to determine the chemical constituents of the waste before disposal. Also, in the past wastes were transported from the shop to the Centralized Accumulation Site (Area 451) and emptied into one of three underground tanks. One 12,000-gallon tank was used for waste oils; one 12,000-gallon tank was used for waste JP-4 fuel; and one 3,000-gallon tank was used for waste solvents. The Compliance Order required all three underground tanks to be leak tested. Unfortunately, the waste oil tank was not tested because a proper seal could not be obtained and results from the waste JP-4 tank were inconclusive. The waste solvent tank was determined to be leaking at a rate of 0.301 gallons/hour. The base plans to remove all three underground tanks according to Environmental Protection Agency (EPA) approved closure procedures.

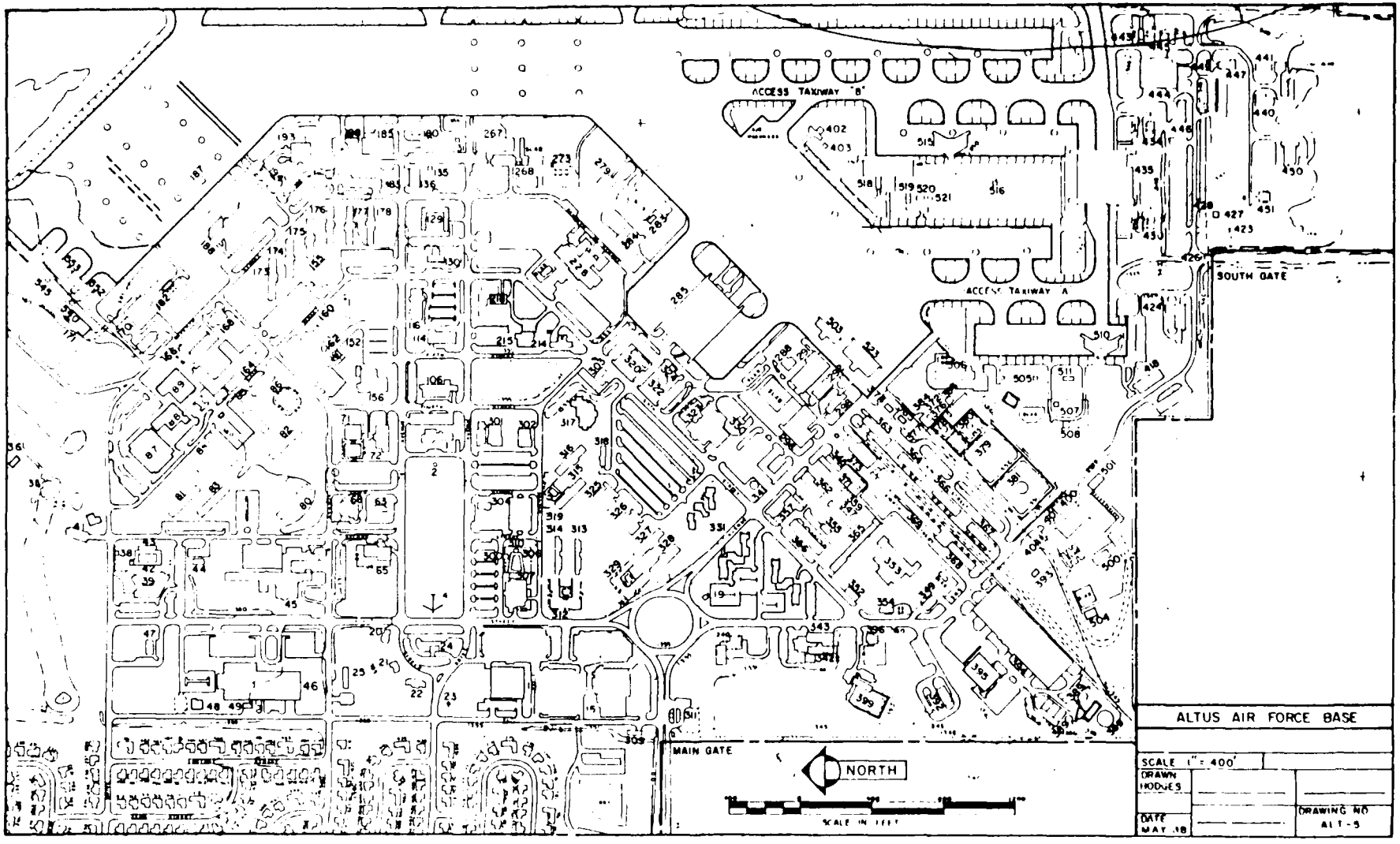

Figure 1. Base Map

During the survey, the base hazardous waste program was in a transition stage. Mr Dan Staton, the Environmental Protection Specialist, was assigned to develop and manage the hazardous waste program in the Fall of 1988. One of his first efforts was to educate base personnel in hazardous waste management. The first hazardous waste training program was given in December 88 to all designated hazardous waste managers and assistants (see Appendix B for the training synopsis). The program focused on proper labeling and disposal of chemical wastes. The training program received favorable comments from hazardous waste managers and assistants throughout the base.

The current hazardous waste program still needs development. All chemical wastes (including waste oils) are segregated and placed in 55-gallon drums. All facilities on base except the Centralized Accumulation Site (Area 451), Aircraft Washrack Separator (Building 402) and Corrosion Control Separator (Building 291) are considered satellite accumulation sites. To be considered a satellite accumulation site, less than 55 gallons of hazardous waste can be stored at the site at any one time. All wastes are taken to Area 451 for contract disposal (see Figure 2). The Defense Reutilization Marketing Office (DRMO) located at Ft Sill, Oklahoma, administers the chemical waste disposal contract. If any unknown waste drums are located, the Base Bioenvironmental Engineer (BEE) is contacted and the contents sampled before disposal.

Figure 2. Area 451, Centralized Accumulation Site

The disposal procedures for hazardous and nonhazardous wastes are generally the same. Nonhazardous wastes at the satellite accumulation site are not regulated by volume limitations. However, the same paperwork is completed.

When a hazardous waste drum is 90% full, the shop generating the waste contacts Mr Staton to visit the shop and inspect the drum for integrity and proper labeling. The shop personnel and Mr Staton complete an AF Form 2005, Issue/Turn-in Request, for submission to Base Supply together. Base Supply uses the AF Form 2005 to complete a DD Form 1348-1 manifesting the waste for disposal.

When the drum is full, the shop has three days to transport the waste to the Centralized Accumulation Site, Area 451. Either Mr Staton or Civil Engineering (CE) Water and Waste Shop personnel will open Area 451 to receive waste from the shop. The shop personnel, using either government forklifts or vehicles, transport the waste drum to Area 451 where Mr Staton or a CE Water and Waste Shop employee will sign the DD Form 1348-1 to take responsibility of the waste.

Then Mr Staton takes the DD Form 1348-1 to Base Supply. The form is hand carried to Ms Geneva Redway at DRMO who becomes accountable for the waste by signing the DD Form 1348-1. She arranges for a contractor (currently Special Waste Inc.) to pick up the waste at Altus AFB for disposal. When the contractor arrives to transport the waste from Area 451, Ms Redway or an authorized DRMO representative oversees the operation to insure proper waste removal.

III. PROCEDURE

Prior to the actual survey an information packet containing the Administrative Compliance Order and a listing of industrial facilities on Altus AFB was reviewed. Upon arrival, the survey team reviewed additional documents which included the waste analysis plan, the hazardous waste inventory and the hazardous waste training synopsis. The following personnel were contacted to discuss their responsibilities in the hazardous waste program:

2Lt James Rypkema, Base Bioenvironmental Engineer, AV 866-5255
Mr Dan Staton, Environmental Protection Specialist, AV 866-6198
Ms Geneva Redway, DRMO Representative, AV 639-4703

Following the document review and discussions with key personnel in the hazardous waste program, shops throughout Altus AFB were visited to observe shop activities and to discuss waste disposal practices. The hazardous waste manager or assistant was asked to fill out a chemical waste disposal survey form (see Appendix C) to determine chemical usage and disposal practices. Table 1 is a summary of the annual forecasted wastes generated by Altus AFB. Itemized listings of waste categories, amounts of waste, and disposal methods are found in Appendix D for all wastes and in Appendix E for hazardous wastes.

Table 1. Annual Forecasted Wastes Generated by Major Industrial Facilities on Altus AFB

Wastes	Total (Gallons/Year)	% Total
Oils and Fluids	18228	64.26
Fuels	972	3.43
Solvents and Strippers	1464	5.16
PD-680	2332	8.22
Paint and Thinners	738	2.60
NDI and Photo Chemicals	428	1.51
Battery Acids	400	1.41
Antifreeze	780	2.75
Soaps	3024	10.66
	28366	

IV. INDUSTRIAL ACTIVITIES AND WASTE DISPOSAL PRACTICES

The following section gives a shop-by-shop summary of industrial activities, chemical usage and disposal practices (See Appendix F for a shop-by-shop listing of waste disposal practices). All hazardous and nonhazardous chemicals, unless otherwise stated, are transported from the satellite accumulation site to Area 451 for contract waste disposal through DRMO, Ft Sill.

1. 443rd Field Maintenance Squadron

Shop: Pneudraulics — Building: 285
Contact: TSgt Rakestraw — AUTOVON: 866-7500

Shop personnel are responsible for overhauling and repairing pneudraulic components on C-5 and C-141 aircraft. Waste hydraulic fluid (110 gallons/month) is placed in 55-gallon drums for disposal as nonhazardous waste. The shop has a 165-gallon PD-680 tank that is changed out every three months for disposal as nonhazardous waste. No baseline analysis has been accomplished to determine if the waste PD-680 is nonhazardous. The shop has a 2-gallon container of carbon remover that has not been changed out but is periodically replenished. All used rags are currently taken to linen exchange to be washed and reused.

Shop: Corrosion Control
Contact: SSgt Barton

Building: 291
AUTOVON: 866-7451

This shop is responsible for stripping, corrosion treating and repainting aircraft parts and related equipment. The shop has two dry paint booths. The filters used in the dry paint booths are discarded as municipal waste. No analysis has been conducted to determine if the filters are actually nonhazardous. Waste methyl ethyl ketone (MEK) and polyurethane paints (15 gallons/month) are placed in 55-gallon drums for disposal as hazardous waste. All wastes generated from stripping operations are rinsed down the drain to an oil/water separator connected to the sanitary sewer (see Figure 3). The oil/water separator is periodically pumped out by CE Water and Waste personnel for disposal as hazardous waste. All used rags are thrown in the trash for disposal as municipal waste.

Figure 3. Corrosion Control Stripping Area

Shop: Propulsion Branch
Contact: Sgt Fertitta

Building: 296
AUTOVON: 866-6321

Shop personnel are responsible for the teardown and buildup of TF-33 aircraft engines. Waste motor oil (146 gallons/month), hydraulic fluid (16 gallons/month) and synthetic oil (146 gallons/month) are segregated and

placed in 55-gallon drums for disposal as nonhazardous waste. Carbon remover (5 gallons) and fingerprint remover (5 gallons) tanks are changed out every three months and disposed of as hazardous waste.

The shop also has a 40-gallon PD-680 tank that is changed out every six months. The waste PD-680 is disposed of as nonhazardous waste. No baseline analysis has been accomplished on the waste PD-680 to confirm if the waste is nonhazardous. PD-680 (55 gallons/month) and aircraft soap (55 gallons/month) are used for cleaning equipment. Both chemicals are discharged to an oil/water separator which is connected to the sanitary sewer. All waste rags are thrown in the trash for disposal as municipal waste.

The shop has a 750-gallon waste oil bowser that is contaminated with various solvents as a result of past disposal practices. The contents of the waste oil bowser are currently undergoing chemical analysis to determine proper disposal of the waste (see Figure 4).

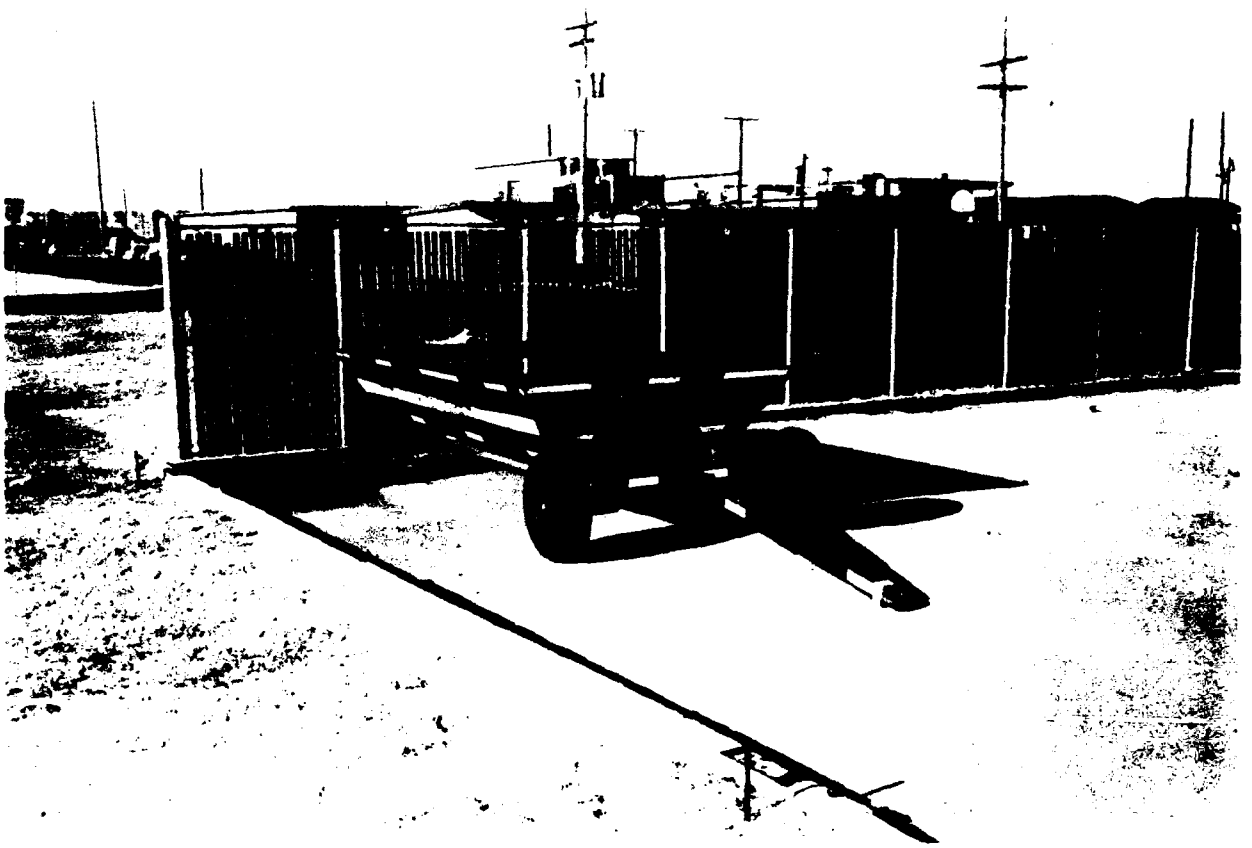

Figure 4. Propulsion Shop Waste Storage Bowser

Shop: Test Cell | Building: 298
Contact: SSgt Fertitta | AUTOVON: 866-7561

This shop is responsible for testing and making minor repairs on TF-33 aircraft engines. Approximately 4 gallons/month of engine oil and 6 gallons/month of JP-4 drain to an oil/water separator that is connected to the sanitary sewer. The oil/water separator is pumped out by CE Water and Waste personnel on an as needed basis. Approximately 6 gallons/month of waste oil are collected in a catch pan and placed in a Propulsion Shop (Building 296) waste oil drum for disposal as nonhazardous waste. The monthly amounts of fuels and oils drained to the separator are highly variable. Used rags are taken to linen exchange to be cleaned and reused.

Shop: NDI | Building: 450
Contact: Mr Breakiron | AUTOVON: 866-6680

NDI personnel perform nondestructive testing on aircraft parts, components and related aerospace equipment using radiography, ultrasonics, eddy currents, magnetic particle and fluorescent penetrants. Developer (2 gallons/month) and fixer (2 gallons/month) used in the radiography process are disposed of down the drain. The fixers first pass through a silver recovery unit before disposal. Magnaglo chemicals (25 gallons/6 months) used in the magnetic particle inspection process are disposed of as nonhazardous waste oil. The emulsifier (110 gallons) and dye penetrant (110 gallons) used in the dye penetrant process are changed out on an as-needed basis and disposed of as hazardous waste. The developer (110 gallons) used in the dye penetrant process is changed out when needed and disposed of down the drain. No baseline analysis has been accomplished on the developer to determine that the waste is nonhazardous. Used rags are drummed for disposal as hazardous waste.

Shop: Aerospace Ground Equipment | Building: 506
Contact: MSgt Ruddock | AUTOVON: 866-7392

Personnel are responsible for inspecting and maintaining all aerospace ground equipment. The shop has one PD-680 tank (20 gallons) that is changed out every year; the waste PD-680 is disposed of as nonhazardous waste. No baseline analysis has been accomplished on the waste PD-680 to confirm that the waste is nonhazardous. All unserviceable batteries are taken to the Battery Shop (Building 320) for disposal. Aircraft soaps (110 gallons/month, diluted 20:1) and PD-680 (1 gallon/month) used for cleaning equipment and floors are washed down the drain to an oil/water separator connected to the sanitary sewer. The oil/water separator is pumped out by CE Water and Waste personnel on an as-needed basis. Waste hydraulic fluid (10 gallons/month), motor oil (250 gallons/month) and synthetic oil (10 gallons/month) are placed together in 55-gallon drums for disposal as nonhazardous waste oil. Used rags are taken to linen exchange for cleaning and reuse.

Two 200-gallon bowsers are located at the satellite accumulation site (see Figure 5). One bowser contains waste synthetic oil and PD-680. The other bowser contains waste motor oil. Both bowsers have been sampled to determine proper disposal of the wastes. The satellite accumulation site and surrounding area showed evidence of oil contaminated soil.

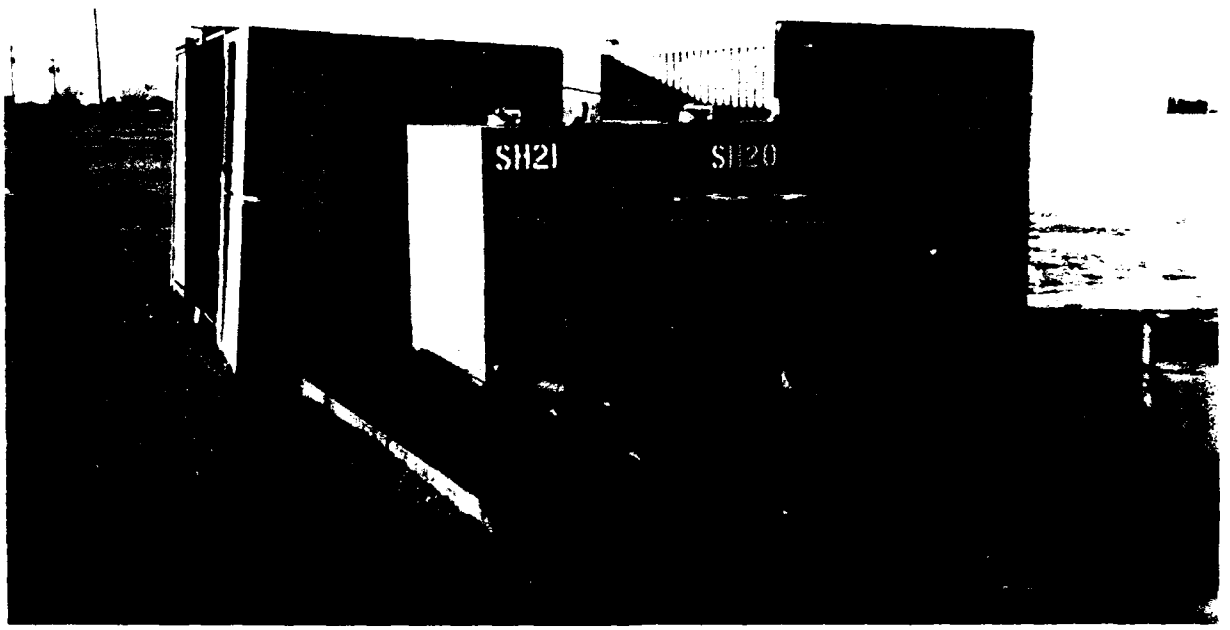

Figure 5. AGE Shop Waste Storage Bowsers

2. 443rd Operations and Maintenance Squadron

Shop: Wheel and Tire — Building: 424
Contact: TSgt Deem — AUTOVON: 866-7185

Shop personnel are responsible for the teardown, cleaning and rebuilding of aircraft wheels and tires. The shop has one PD-680 tank (100-gallon) and one Citrikleen tank (150-gallon) used for cleaning and degreasing aircraft wheels. The tanks are changed out every four months and disposed of as nonhazardous waste. No baseline analysis has been accomplished on either tank to confirm that the contents are nonhazardous. The shop also has a hot stripping vat. B&B stripper (200 gallons, NSN 8010-P9-201) is changed out every six months and disposed of as hazardous waste. All used rags are turned in to linen exchange for cleaning and reuse.

Shop: Jack Maintenance — Building: 435
Contact: TSgt Seaton — AUTOVON: 866-6414

This shop is responsible for servicing and maintaining aircraft jacks. Hydraulic fluid (3 gallons/month) is placed in 55-gallon drums for disposal as nonhazardous waste. All used rags are taken to linen exchange to be washed and reused.

3. 443rd Civil Engineering Squadron

Shop: Power Production — Building: 347
Contact: A1C Fortuin — AUTOVON: 866-7079

Shop personnel are responsible for maintenance and repair of emergency power generators. Used battery acid (10 gallons/month) is neutralized with baking soda and poured down the stormwater sewer system. No baseline analysis has been accomplished on the neutralized battery acid to determine the metals concentrations (see Figure 6). Waste motor oil (22 gallons/month) is placed in 55-gallon drums for disposal as nonhazardous waste oil. Aircraft soap (2 gallons/month, diluted 5:1) used for cleaning equipment is rinsed down the drain to the sanitary sewer. All used rags are thrown in the trash for disposal as municipal waste.

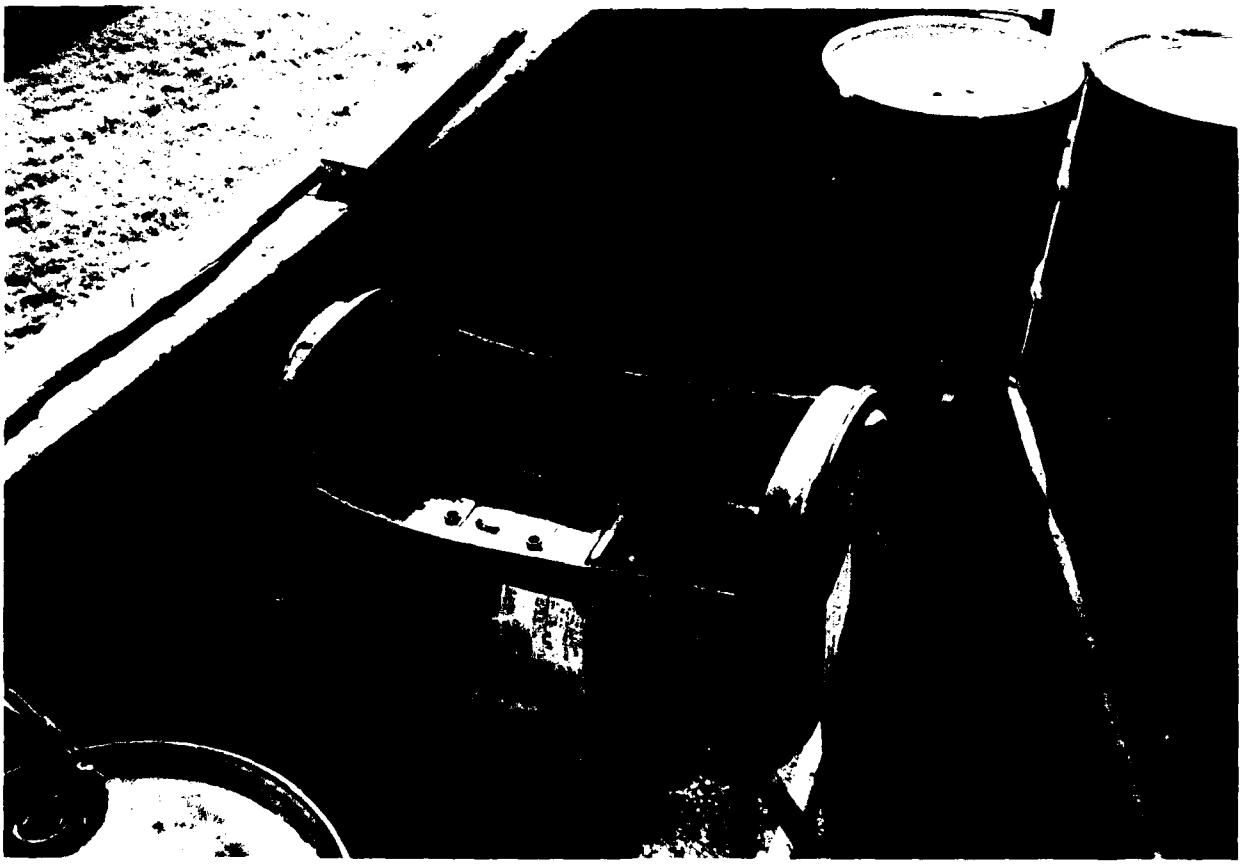

Figure 6. Power Production Battery Neutralization Area

Shop: Refrigeration
Contact: MSgt Frank

Building: 356
AUTOVON: 866-7180

Refrigeration shop personnel are responsible for maintaining air conditioning, refrigeration and ventilation systems on base. Waste motor oils (2 gallons/month) and refrigeration oils (6 gallons/month) are placed in the Power Production Shop (Building 347) waste oil drum for disposal as nonhazardous waste oil. Used rags are taken to linen exchange for cleaning and reuse.

Shop: Paint
Contact: Mr Butler

Building: 356
AUTOVON: 866-7116

Personnel are responsible for painting operations throughout the base. Waste paints (15 gallons/month) and thinners (24 gallons/month) are placed in 55-gallon drums for disposal as hazardous waste. The water from the waterfall paint booth is changed out on an as-needed basis. No analysis has been accomplished on the water to determine if the water is nonhazardous. All waste rags are currently placed in 55-gallon drums for disposal as hazardous waste. The satellite accumulation site located outside the shop contains five full drums (55-gallons each) of waste paint and thinners. In order to be considered a satellite accumulation site, less than 55 gallons of hazardous waste can be stored at the site at any one time (see Figure 7).

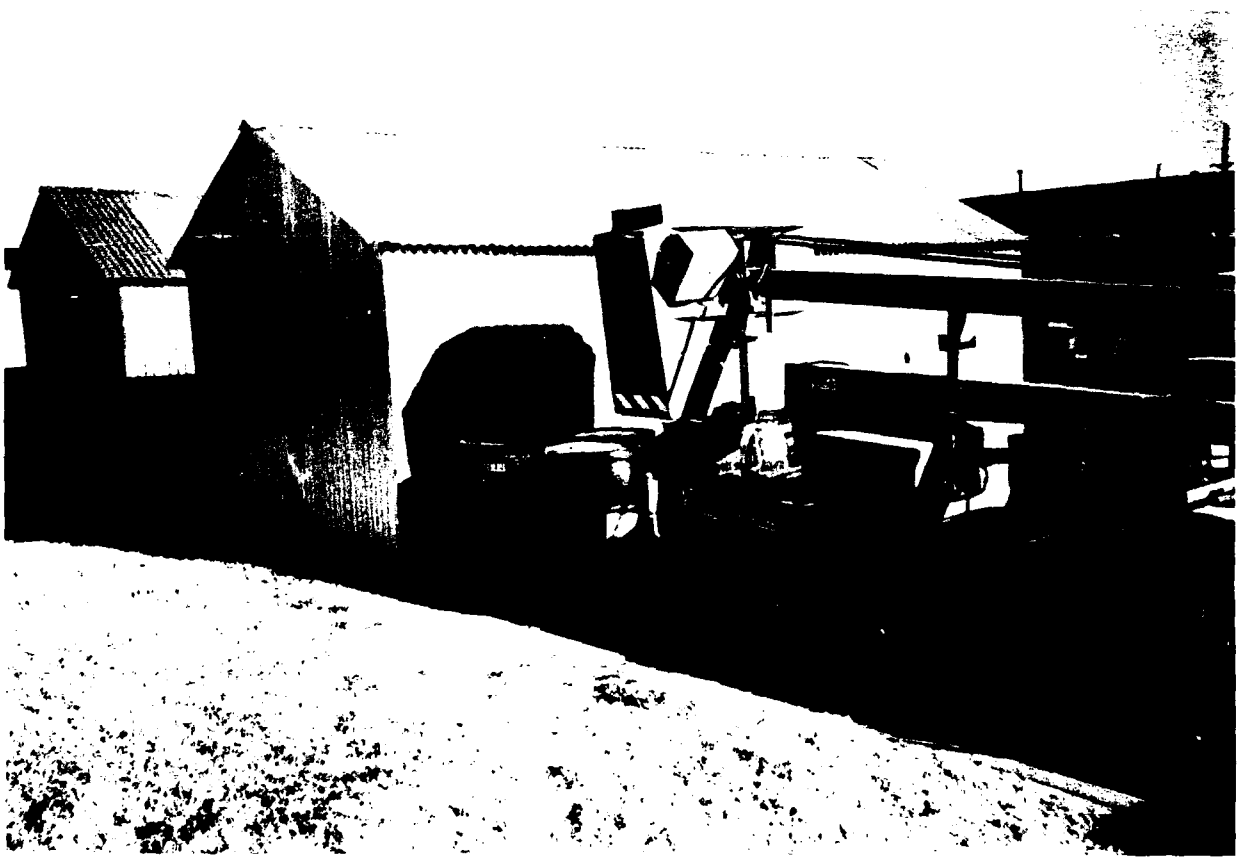

Figure 7. Paint Shop Satellite Accumulation Site

4. 443rd Transportation Squadron

Shop: Fire Truck Maintenance — Building: 267
Contact: SSgt Laws — AUTOVON: 866-5980

Shop personnel are responsible for maintenance of fire truck vehicles. Waste transmission fluid (1 gallon/month) and motor oil (30 gallons/month) are placed in separate 55-gallon drums for disposal as nonhazardous waste oil. Used antifreeze (20 gallons/month) is placed in 55-gallon drums for disposal as nonhazardous waste. Nonserviceable batteries (1 battery/3 months) are disposed of through the Vehicle Maintenance Battery Shop. Used rags are taken to linen exchange for clean rags.

Shop: Special and General Purpose — Building: 353
Contact: SSgt Laws — AUTOVON: 866-5980

Personnel repair and maintain all military and special purpose vehicles. Battery acid from unserviceable batteries (18 batteries/month) is neutralized with baking soda and poured down the drain to a limestone filter system before entering the sanitary sewer system. Aircraft soap (20 gallons/month) used for cleaning floors and equipment is rinsed down the drain to the sanitary sewer system. The shop has an oil/water separator that is pumped out by CE Water and Waste personnel on an as-needed basis.

Waste transmission fluid (12 gallons/month) and hydraulic fluid (60 gallons/month) are placed together in 55-gallon drums for disposal as nonhazardous waste. Waste motor oil (140 gallons/month) is placed in 55-gallon drums for disposal as nonhazardous waste oil. The shop has a PD-680 tank (20 gallons) that is changed out every two months; the waste PD-680 is disposed of as nonhazardous waste. No analysis has been accomplished on either the neutralized battery acid to determine lead concentration or the PD-680 to determine if the waste is nonhazardous. Used rags are taken to linen exchange for cleaning and reuse.

The satellite accumulation site is located behind the building. There is evidence of chemical spills at the site and numerous waste drums were unsecured. The shop has a 500-gallon bowser at the satellite accumulation site that appears to be leaking. The bowser contains various quantities of waste oils, antifreeze and solvents. Shop personnel are awaiting analytical results to determine the proper disposal method for the waste (see Figure 8).

Shop: Allied Trades — Building: 353
Contact: SSgt Laws — AUTOVON: 866-5980

Personnel are responsible for painting military and special purpose vehicles. Waste paints (3 gallons/month) are placed in a 10-gallon drum for disposal as hazardous waste. Dope and lacquer thinner (8 gallons/month) and MEK (1 gallon/month) are placed in a 30-gallon drum for disposal as hazardous waste. Any rags that have come in contact with thinners or MEK are drummed for disposal as hazardous waste.

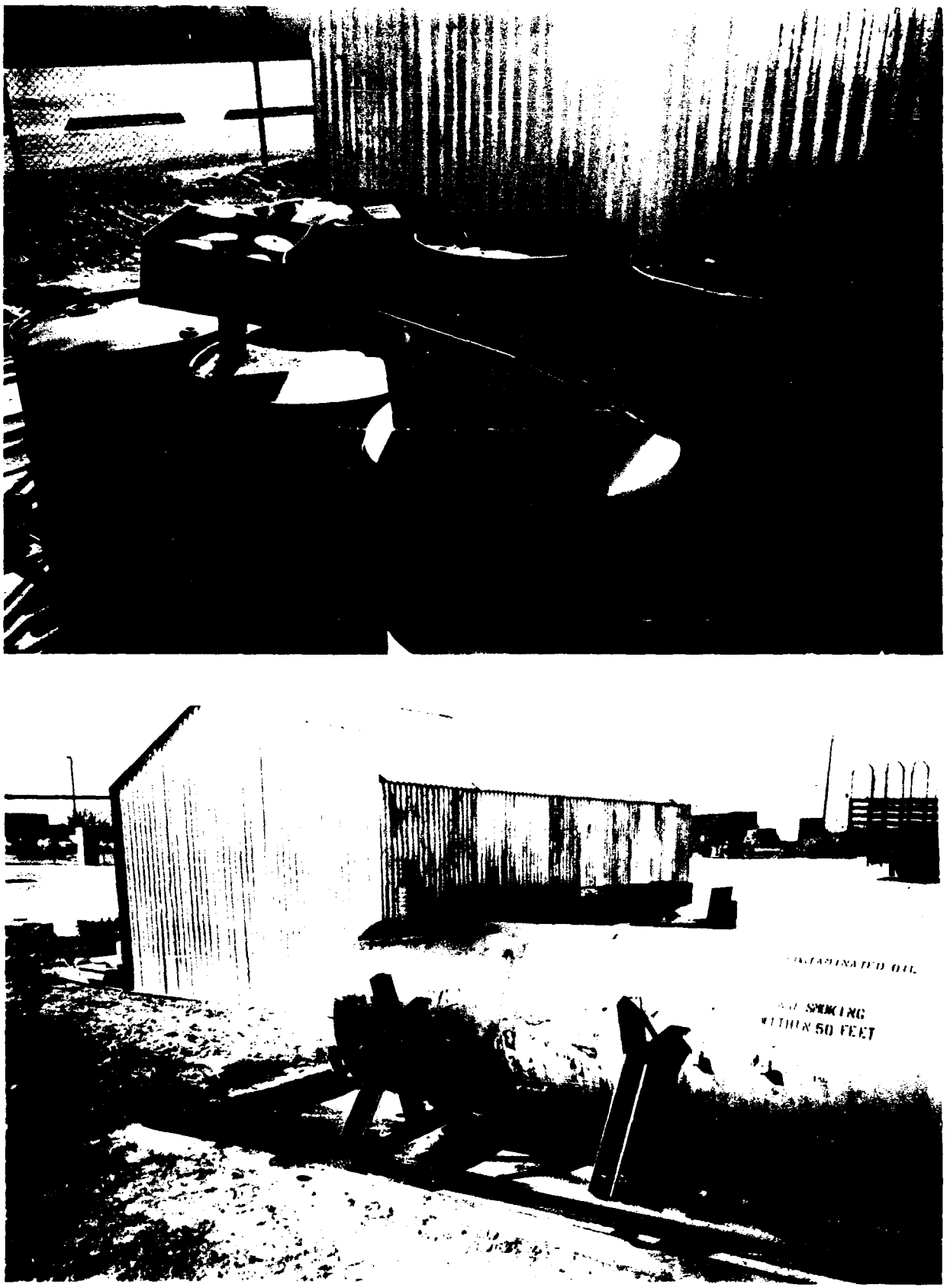

Figure 8. Transportation Shop Satellite Accumulation Area

Shop: Refueling Maintenance — Building: 392
Contact: SSgt Laws — AUTOVON: 866-5980

This shop is responsible for the maintenance and repair of refueling tank trucks. Waste motor oil (40 gallons/month) is placed in 55-gallon drums for disposal as nonhazardous waste oil. Waste JP-4 fuel (75 gallons/ month) from repair operations drains directly into an oil/water separator that is connected to the sanitary sewer. The oil/water separator is periodically pumped out by CE Water and Waste personnel. Shop personnel do not use catch pans for the JP-4 fuel.

5. 340th Consolidated Aircraft Maintenance Squadron

Shop: SAC Refurbishing — Building: 523
Contact: SSgt Copeland — AUTOVON: 866-7456

Shop personnel are responsible for sanding, stripping, priming and repainting the interior and exterior of KC-135 aircraft. Waste paints (3 gallons/month) and thinners (1 gallon/month) are drummed for disposal as hazardous waste. Paint chips are thrown in the trash for disposal as municipal waste. Used rags that have come in contact with thinners are drummed for disposal as hazardous waste.

6. 443rd Air Base Group

Shop: Auto Hobby Shop — Building: 343
Contact: Mr Tyler — AUTOVON: 866-6326

Auto Hobby Shop personnel oversee the maintenance and repair of personal vehicles. Unserviceable batteries (5/month) are turned in wet (with battery acid) to a civilian contractor for disposal. The shop has two 20-gallon Safety Kleen units that are changed out by contract on a monthly basis. Aircraft soap (65 gallons/month), PD-680 (40 gallons/month), lube oil (5 gallons/month), and used antifreeze (45 gallons/month) are rinsed down the drain to an oil/water separator connected to the sanitary sewer system. The oil/water separator is pumped out on an as-needed basis by CE Water and Waste personnel.

Waste motor oil (300 gallons/month) and transmission fluid (200 gallon/month) are drained to an underground tank that is periodically pumped out by a waste oil contractor. There is evidence of oil contaminated soil surrounding the area (see Figure 9). The underground waste oil tank has never been leak tested. Used rags are taken to linen exchange for cleaning and reuse.

Figure 9. Auto Hobby Shop Waste Oil Storage Tank

V. SUMMARY OF WASTE DISPOSAL PRACTICES

Waste disposal practices for different categories of waste are summarized in the following section. Both hazardous and nonhazardous wastes are transported to Area 451 for disposal through DRMO.

1. All waste paint and thinner mixtures are placed in 55-gallon drums for disposal as hazardous waste. Empty paint cans are thrown in the trash for municipal disposal.

2. All waste strippers are placed in 55-gallon drums for disposal as hazardous waste. However, stripping wastes from the Corrosion Control Shop (Building 291) are rinsed down the drain to the sanitary sewer.

3. Most used battery acid is neutralized with baking soda and disposed of down the drain to the sanitary sewer. The neutralized battery acid from Power Production Shop (Building 347) is disposed of in the stormwater sewer system. The Auto Hobby Shop (Building 343) has a local contract for wet battery disposal.

4. All waste soaps are diluted with varying amounts of water and rinsed down the drain to the sanitary sewer.

5. All waste oil is placed in 55-gallon drums for disposal as nonhazardous waste.

6. Waste hydraulic and transmission fluids are drummed separately from the waste oil for disposal as nonhazardous waste. Auto Hobby Shop (Building 343) and AGE Shop (Building 506) dispose of waste oil and transmission fluid together.

7. Waste fuels are placed in 55-gallon drums for disposal as hazardous waste. However, waste JP-4 from Refueling Maintenance Shop (Building 392) and Test Cell (Building 298) is drained into a fuel/water separator connected to the sanitary sewer system.

8. Waste antifreeze is generally placed in 55-gallon drums for disposal as nonhazardous waste. Waste antifreeze from the Auto Hobby Shop (Building 343) is disposed of down the drain to the sanitary sewer system.

9. Waste PD-680 is placed in 55-gallon drums for disposal as nonhazardous waste. PD-680 used for cleaning operations is drained to the sanitary sewer.

10. Used rags are generally taken to linen exchange for cleaning and reuse. However, any rags that have been in contact with a hazardous waste are currently drummed for disposal as a hazardous waste.

11. Waste fixers are processed through a silver recovery unit before being discharged to the sanitary sewer. Other photo chemicals are discharged directly to the sanitary sewer.

12. Emulsifier and penetrant from NDI (Building 450) are drummed and disposed of as hazardous waste. Other NDI chemicals are discharged to the sanitary sewer.

13. Paint chips from SAC Refurbishing (Building 523) are disposed of as municipal waste.

VI. CONCLUSIONS

A. As a result of an Administrative Compliance Order issued by the Oklahoma State Department of Health on 26 July 88, Altus AFB was required to develop a formal hazardous waste program. The current hazardous waste program, although working, still needs further development.

In the fall of 1988, Mr Dan Staton was assigned the responsibility of Environmental Protection Specialist. His prime objective was to correct the Notice of Violations (NOVs) in the Compliance Order and establish a workable hazardous waste program. Mr Staton has taken major steps in correcting the NOVs and establishing a hazardous waste program.

B. Due to past disposal practices, chemical analysis is being performed on many wastestreams throughout the base. The results will be used tc insure wastes will be disposed of properly in the future. The contents of all waste bowsers and the underground storage tanks at Area 451 are awaiting disposal. In addition, the underground tanks in Area 451 are scheduled to be removed according to the EPA approved closure plan.

C. Currently, all wastes on Altus AFB are segregated and drummed for disposal (including rags which come in contact with a hazardous waste). The majority of shops throughout the base do not keep written logs on the contents of the drummed wastes. Drumming all wastes is time consuming for shops (e.g., Pneudraulics Shop, AGE Shop, Transportation Shop, Propulsion Shop) generating large quantities of waste oils and fluids.

D. The Centralized Accumulation Site (Area 451) and the outdoor satellite accumulation sites at the AGE Shop (Building 506) and Transportation Shop (Building 353) need to be upgraded to prevent future environmental problems. The satellite accumulation sites at the AGE Shop and Transportation Shop are unsecured, and consequently, facilitate intentional or accidental contamination of segregated wastes. Chemical spillage (possibly from waste oil) is also evident at both sites. The Centralized Accumulation Site is located on a gravel surface with no means to contain a spill except for a small spill containment area located within the site.

E. The CE Paint Shop (Building 356), at the time of the survey, had five full drums of waste paints and thinners. In order to be considered a satellite accumulation site, less than 55-gallons of hazardous waste can be stored at the site at any one time. The accumulation of five full drums of hazardous waste appears to be prohibited by 40 CFR part 262.

F. A considerable amount of PD-680 (2868 gallons/year) is used for cleaning and degreasing. To reduce PD-680 usage, many Air Force installations have switched to a solvent leasing company that services solvent tanks.

G. Most battery shops throughout the base are neutralizing electrolyte from lead-acid batteries with sodium bicarbonate and disposing the solution in the sanitary sewer. Power Production Shop (Building 347) is the only shop disposing neutralized battery acid to the stormwater sewer. No baseline analysis has been accomplished to determine the lead concentration of the neutralized battery acid.

H. Most used rags on Altus AFB are sent to linen exchange for cleaning. However, rags contaminated with a hazardous waste are drummed for disposal as hazardous waste. This method is costly and time consuming. Consideration should be given to sending the rags to linen exchange for washing and reuse.

I. At Refueling Maintenance Shop (Building 392) approximately 75 gallons/month of JP-4 drains to an oil/water separator connected to the sanitary sewer. Many Air Force installations use catch pans to reduce the amount of JP-4 entering the sanitary sewer and recover usable fuel.

J. The Auto Hobby Shop (Building 343) has an underground tank for waste oils, hydraulic, and transmission fluids. The underground tank has not been leak tested for integrity. The salvage value of the wastes may be increased by segregating the waste oils from the waste transmission and hydraulic fluids.

VII. RECOMMENDATIONS

A detailed outbriefing on recommendations was given to the Base Commander, Base Civil Engineer, Base Bioenvironmental Engineer, and Environmental Protection Specialist on 13 Jan 89.

1. Centralized aboveground tanks should be installed for the accumulation of waste oils, waste transmission and hydraulic fluids and waste fuels. This arrangement will enhance the possibility of recycling these wastes.

2. Although not required by law, the accumulation sites should be upgraded to prevent future problems. Accumulation sites should be secured, diked, covered and located on impermeable surfaces.

3. The Pneudraulics Shop, AGE Shop, Transportation Shop, Propulsion Shop, Auto Hobby Shop and Refueling Maintenance Shop need to use secured, mobile waste bowsers to dispose and transport their waste oils and fluids.

4. RCRA requires a waste analysis plan be developed to characterize the wastestreams (see Table 2 for example). The plan should include: a complete listing of all known wastestreams with a brief description of the process or operation generating the waste, the results of the baseline chemical analysis (to fully characterize the waste), the required analysis frequency, the sampling technique, and the parameters of analysis. Table 3 lists waste-streams found during the survey that need to be analyzed for the analysis plan.

5. The extent of contamination from chemical spills at the AGE Shop (Building 506) and Transportation Shop (Building 353) outdoor satellite accumulation sites needs to be determined. If the soil contains hazardous substances, it needs to be removed and the site recovered.

6. Refueling Maintenance Shop should use catch pans for JP-4 to reduce the amount of fuel entering the sanitary sewer system.

7. Used rags being disposed of as hazardous waste should be sent to linen exchange for cleaning and reuse.

8. The base should contract with a solvent leasing company to minimize the amount of solvents being disposed of through DRMO.

9. The disposal of unserviceable batteries (similar to Auto Hobby Shop, Building 343) should also be pursued as an alternative to the current disposal method.

10. The Power Production Shop is improperly disposing neutralized battery acid to the stormwater system. This wastestream should be redirected to the sanitary sewer system.

GENERATOR LOCATION	DESCRIPTION OF WASTE STREAM	WASTE STREAM CODE	BASELINE ANALYSIS DATE & RESULTS	*SAMPLING METHOD	*SAMPLING FREQUENCY	*PARAMETERS REQUIRED	*TEST METHOD	PROPER SHIPPING NAME & HAZARD CLASS	DISPOSAL METHOD	EPA HAZARDOUS WASTE #
Corrosion Control BLD 150	Paint sludge from paint booth	CC150-001	May 88 FP-H (70F) pH-NH RX-NH EP-H Cadmium Chromium	1 Grab sample	Every other drum	Flash Point Cadmium Chromium	1010 7130 7190	Waste Paint related material, mixture/FLAMMABLE LIQUID	DRMO	D001 D006 D007
Corrosion Control BLD 150	Rinsewater from waterfall paint booth	CC150-002	May 88 FP-NH pH-NH RX-NH TM-NH	Dipper	Every third cleanout of booth	Complete Analysis		N/A	Down Drain	
Corrosion Control BLD 150	Spent plastic bead blasting media	CC150-003	Aug 88 FP-NH pH-NA RX-NH EP-H Cadmium Chromium	1 Composite Sample	From every other drum	 Cadmium Chromium	 7130 7190	Hazardous waste solid (n.o.s.) (Cadmium & Chromium contaminated material)	DRMO	 D006 D007
Vehicle Maint. BLD 100	Waste Motor oil	VM100-001	Jun 88 FP-H (100F) pH-NA RX-NH TM-H Arsenic Cadmium Chromium Lead Total Halogens	Coliwasa	Quarterly	Flash Point Arsenic Cadmium Chromium Lead Total Halogens	1010 7061 7130 7190 7421 8010	N/A	Sold to Contractor for Recycle	D001 D004 D006 D007 D008
Vehicle Maint. BLD 100	Neutralized Battery Acid	VM100-0002	Aug 88 FP-NH pH-NH RX-NH TM-NH Lead	Grab Sample from tank using dipper	Semiannual	 Lead	 7421	N/A	Down Drain	 D008

Legend: FP - Flash Point
EP - EP Toxicity
TM - Total Metals
RX - Reactivity
NA -Not Applicable
H - Hazardous
NR - Non-Hazardous

Table 2. Example of a Waste Analysis Plan

FACILITY/BUILDING #	NAME OF WASTE	SAMPLE POINT	PARAMETER	SAMPLING METHOD	NUMBER OF SAMPLES
Pneudraulics (285) Propulsion (296) Transportation (353) Wheel and Tire (424) AGE (506)	Waste PD-680	Drum	Ignitability, Metals	Coliwasa	3 separate changouts
Corrosion (291)	Paint residue	Paint filters	EP Toxicity	2" by 2" material	3 seperate changeouts
CE Paint (356) Transportation (353)	Paintbooth wastewater	Holding tank	Volitile hydrocarbons	Dipper	3 separate changeouts
Wheel and Tire (424)	Waste Citri-Kleen solvent	Drum	Ignitability, Metals	Coliwasa	3 separate changeouts
Battery (320) Power Prod (347) Transportation (353)	Neutralized battery acid	tank	pH, lead	Dipper	3 separate changeouts

Table 3. Wastestreams on Altus AFB Needing Analysis

References

1. Code of Federal Regulations Title 40, Part 260 - Hazardous Waste Management System: General, Office of the Federal Register, Washington DC (1987).

2. Code of Federal Regulations Title 40, Part 261 - Identification and Listing of Hazardous Waste, Office of the Federal Register, Washington DC (1987).

3. Code of Federal Regulations Title 40, Part 262 - Standards Applicable to Generators of Hazardous Waste, Office of the Federal Register, Washington DC (1987).

4. Code of Federal Regulations Title 40, Part 280 - Underground Storage Tanks, Office of the Federal Register, Washington DC (1987).

5. Controlled Industrial Waste Administrative Compliance Order, Oklahoma State Department of Health, No. EH-88-98.

APPENDIX A

Violations in the Administrative Compliance Order

Summary of Violations Contained in the Administrative Compliance Order, EH-88-98, Issued 26 July 1988

1. Altus AFB has failed to make an adequate hazardous waste determination of wastes which are generated.

2. Altus AFB has failed to have a representative of Altus AFB sign hazardous waste manifests.

3. Altus AFB has failed to keep copies of Biennial Reports and test results for hazardous waste determination.

4. Altus AFB has failed to develop a waste analysis plan.

5. Altus AFB has failed to develop a written inspection schedule.

6. Altus AFB has failed to record inspections in an inspection log and keep records for the container and tank storage areas.

7. Altus AFB has failed to design a facility specific personnel training program.

8. Altus AFB has failed to keep personnel training records

9. Altus AFB has failed to equip the storage area with (1) an internal communication or alarm system; and (2) a telephone or two-way radio.

10. Altus AFB has failed to include in its contingency plan (1) descriptions of arrangements with police, fire and hospital officers and (2) an evacuation plan.

11. Altus AFB has failed to supply local police and fire departments with a copy of its contingency plan.

12. Altus AFB has failed to develop an operating record.

13. Altus AFB has failed to develop a closure plan for the tanks and container storage areas.

14. Altus AFB has failed to provide an assessment of existing tank system's integrity.

APPENDIX B

Altus AFB Hazardous Waste Training Program

Altus Air Force Base

Hazardous Waste Seminar

December, 1988

Introduction to Hazardous Wastes (Short Video)
Resource Conservation and Recovery Act Overview
Typical Military Compounds

Break

Satellite Accumulation Point Protocol
Inventory and Segregation of Wastes
Liquid Hazardous Wastes (Short Video)

Break

Handling Hazardous Wastes (Short Video)
Containers
Marking and Labeling
Record keeping
Turn-In Procedures

Break

Spills Happen (Short Video)
Altus Air Force Base Spill Response Plan
Fire and Safety

Conclusion

APPENDIX C

Chemical Waste Disposal Survey Form

PLEASE HAVE THIS FORM READY FOR PICKUP BY:

SHOP: BLDG:

CONTACT: AUTOVON:

Please fill out this form as accurately and completely as possible. If you have any questions on filling it out, please call Major Ng, Lt Zimmer, or Lt Hedgecock at X-5488.

Examples:

	Tank Capacity	Change Out Frequency	Method of Disposal
PD-680 used in tank	60 gal	4/year	55-gal drum

Comments: 1/2 gal of MEK per month is used as a wipe on/wipe off process for parts cleaning. None is disposed of.

OILS & FLUIDS

	Amt of Waste	Disposal Method
Brake Fluid	6 gal	placed in
Transmission Fluid	10 gal	same 600-gal
Hydraulic Fluid	3 gal	bowser
Motor Oil	50 gal	500-gal UGT
Synthetic Oil	8 gal	55-gal drum

QUESTIONS: If question does not apply to this shop put "N/A" beside it.

1. Does this shop have any underground storage tanks?_____

   If yes: How many?_____

   Capacity?_____

   What is stored in the tank?_____

_____

   How often is it cleaned out?_____

   Has it ever been leak-tested?_____

2. Do the floor drains of the shop lead to an oil/water separator?_____

   If yes: How often is it cleaned out?_____

3. Does the shop have any Safety Kleen units?_____

   If yes: How many?_____

   Tank capacity?_____

   How often are they serviced?_____

4. What does the shop do with dirty rags?_____

_____

5. What does the shop do with used "Speedy Dry"?_____

_____

6. Describe shop activities and responsibilities below:

PAINT WASTE AND THINNERS

PAINTS	Amount of Waste generated/month	Disposal Method
Latex		
Polyurathane		
Enamel		
Other		

Comments

THINNERS (list below)

Comments

STRIPPERS

Name of Stripper	National Stock #	Amount of Waste per Month	OR Tank Size	Change Out Freq

Comments

ACIDS

Name of Acid	Manufacturer	Amount of Waste generated/month	Method of Disposal

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Comments

BATTERIES

Type of Battery	#/Month	Neutralized in Shop or Turned in Wet

Comments:

SOAPS/CLEANERS

Name of Soap	Dilution Ratio	National Stock#	Amt Used / month	Disposal Method

---

Comments

OILS AND FLUIDS

	Amt. of Waste Generated/month	Disposal Method
Brake Fluid		
Transmission Fluid		
Hydraulic Fluid		
Motor Oil		
Synthetic Oil		
Other		
Comments		

SOLVENTS/DEGREASANTS

Name of Chemical	Amt. of Waste generated/mo.	OR Tank Size	Change Out Freq	Disposal Method
Carbon Remover				
PD-680 used in tank				
Pd-680 used on washrack				
Other:				
Comments				

PHOTO CHEMICALS

Name of Chemical	Manufacturer	Amt/mo	OR Tank Size	Change Out freq	Disposal Method

Is the fixer processed through a silver recovery unit before disposal?_____

NDI Chemicals

Name of Chemical	Manufacturer	National Stock #	Tank Size	Change Out Freq	Disposal Method
Emulsifier					
Dye Penetrant					
Developer					
Comments					

FUELS

Name of Fuel	Amount/Month	Disposal Method

ANTIFREEZE

	Amount/Month	Disposal Method

OTHER CHEMICALS

Name of Chemical	Manufacturer	National Stock #	Tank Size	Change Out Freq	Disposal Method

Signature of person filling out this form_____

APPENDIX D

Summary of Waste Disposal Practices for Each Waste Category

SUMMARY OF WASTE DISPOSAL PRACTICES FOR EACH WASTE CATEGORY

WASTE: OILS AND FLUIDS

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
443 FMS Pneudraulics	Hydraulic Fluid	1320	DNH
443 FMS Propulsion Branch	Hydraulic Fluid	192	DNH
443 ABG Auto Hobby	Motor Oil	60	OWS
443 FMS Propulsion Branch	Synthetic Oil	1752	DNH
443 TRANS Fire Truck Maint	Transmission Fluid	12	DNH
443 FMS Propulsion Branch	Motor Oil	1752	DNH
443 FMS AGE	Synthetic Oil	120	DNH
443 TRANS Fire Truck Maint	Motor Oil	360	DNH
443 TRANS Spec and Gen Maint	Motor Oil	1680	DNH
443 FMS AGE	Hydraulic Fluid	120	DNH
443 CES Power Production	Motor Oil	264	DNH
443 FMS AGE	Motor Oil	3000	DNH
443 TRANS Refueling Maint	Motor Oil	480	DNH
443 CES Refrigeration	Motor Oil	24	DNH
443 ABG Auto Hobby	Motor Oil	3600	UGT
443 CES Refrigeration	Refrig Oil	72	DNH
443 TRANS Spec and Gen Maint	Transmission Fluid	144	DNH
443 FMS Test Cell	Engine Oil	72	DNH

443 ABG Auto Hobby	Transmission Fluid	2400	UGT
443 OMS Jack Maintenance	Hydraulic Fluid	36	DNH
443 TRANS Spec and Gen Maint	Hydraulic Fluid	720	DNH
443 FMS Test Cell	Engine Oil	48	OWS
	TOTAL:	18228	

WASTE: FUELS

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
443 TRANS Refueling Maint	JP-4	900	OWS
443 FMS Test Cell	JP-4	72	OWS
	TOTAL:	972	

WASTE: PD-680

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
443 FMS AGE	PD-680	20	DNH
443 FMS Pneudraulics	PD-680	660	DNH
443 FMS Propulsion Branch	PD-680	660	OWS
443 TRANS Spec and Gen Maint	PD-680	120	DNH
443 FMS AGE	PD-680	12	OWS
443 OMS Wheel and Tire	PD-680	300	DNH
443 FMS Propulsion Branch	PD-680	80	DNH
443 ABG Auto Hobby	PD-680	480	OWS
	TOTAL:	2332	

WASTE: Solvents and Strippers

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
443 FMS Propulsion Branch	Carbon Remover	20	DH
443 FMS Propulsion Branch	Fingerprint Rem	20	DH
443 ABG Auto Hobby	Safety Kleen	480	SBC
443 FMS Pneudraulics	Carbon Remover	NQ	REP
443 OMS Wheel and Tire	Citrikleen	450	DNH
443 TRANS Allied Trades	MEK	4	DH
443 FMS Corrosion Control	MEK	90	DH
443 OMS Wheel and Tire	NSN 8010-P9-201	400	DH
	TOTAL:	1464	

WASTE: PAINTS AND THINNERS

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
340 CAMS SAC Refurbishing	Thinner	12	DH
340 CAMS SAC Refurbishing	Paint	36	DH
443 CES Paint	Paint	180	DH
443 CES Paint	Thinner	288	DH
443 FMS Corrosion Control	Poly Paint	90	DH
443 TRANS Allied Trades	Thinner	96	DH
443 TRANS Allied Trades	Paint	36	DH
	TOTAL:	738	

WASTE: NDI AND PHOTO CHEMICALS

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL

443 FMS NDI	Emulsifier	110	DH
443 FMS NDI	Dye Penetrant	110	DH
443 FMS NDI	X-Ray Fixer	24	SRDD
443 FMS NDI	Magnaglo	50	DNH
443 FMS NDI	X-Ray Developer	24	DD
443 FMS NDI	Developer	110	DD
	TOTAL:	428	

WASTE: BATTERIES AND ACIDS

SHOP	WASTE	QTY/YR	DISPOSAL
443 FMS AGE	Batteries	NQ	NDD
443 ABG Auto Hobby	Batteries	60	REC
443 CES Power Production	Battery Acid	120	NDD
443 TRANS Fire Truck Maint	Batteries	4	NDD
443 TRANS Spec and Gen Maint	Batteries	216	NDD
	TOTAL:	400	

WASTE: ANTIFREEZE

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL
443 ABG Auto Hobby	Antifreeze	540	OWS
443 TRANS Fire Truck Maint	Antifreeze	240	DNH
443 TRANS Gen and Spec Purp	Antifreeze	NQ	DNH
	TOTAL:	780	

WASTE: SOAPS

SHOP	WASTE	QTY(GAL/YR)	DISPOSAL

443 ABG Auto Hobby	Aircraft Soap	780	OWS
443 FMS Propulsion Branch	Aircraft Soap	660	OWS
443 FMS AGE	Aircraft Soap	1320	OWS
443 TRANS Spec and Gen Maint	Aircraft Soap	240	OWS
	TOTAL:	3024	

WASTE: RAGS

SHOP	WASTE	QTY/YR	DISPOSAL
443 TRANS Allied Trades	Rags	NQ	DH
443 FMS Pneudraulics	Rags	NQ	BL
443 FMS Test Cell	Rags	NQ	BL
443 FMS NDI	Rags	NQ	DH
443 CES Refrigeration	Rags	NQ	BL
443 OMS Wheel and Tire	Rags	NQ	BL
443 CES Power Production	Rags	NQ	T
443 FMS AGE	Rags	NQ	BL
443 TRANS Fire Truck Maint	Rags	NQ	BL
340 CAMS SAC Refurbishing	Rags	NQ	DH
443 FMS Corrosion Control	Rags	NQ	T
443 CES Paint	Rags	NQ	DH
443 TRANS Spec and Gen Maint	Rags	NQ	BL
443 OMS Jack Maintenance	Rags	NQ	BL

443 OMS Jack Maintenance	Rags		NQ	BL

LEGEND:

BL	- BASE LAUNDRY	REP	- REPLENISHED
DD	- DOWN DRAIN	OWS	- OIL/WATER SEPARATOR
DH	- DRUMMED AS HAZ WASTE	DNH	- DRUMMED AS NONHAZ WASTE
NQ	- AMT NOT QUANTIFIED	REC	- RECYCLED
T	- MUNICIPAL TRASH	NDD	- NEUTRALIZED THEN DOWN DRAIN
UGT	- UNDERGROUND TANK	SBC	- SERVICED BY CONTRACTOR
SRDD	- SILVER RECOVERY THEN DOWN DRAIN		

APPENDIX E

Waste Generated and Disposed of as Hazardous Waste at Altus AFB

WASTES GENERATED AND DISPOSED OF AS HAZARDOUS WASTE AT ALTUS AFB

Type of Waste: SOLVENTS

SHOP	BLD #	PRODUCT	QTY(GAL/YR)
443 FMS Corrosion Control	291	MEK	90
443 OMS Wheel and Tire	424	NSN 8010-P9-201	400
443 TRANS Allied Trades	353	MEK	4
443 FMS Propulsion Branch	296	Carbon Remover	20
443 FMS Propulsion Branch	296	Fingerprint Remover	20
		TOTAL:	534

Type of Waste: PAINTS AND THINNERS

SHOP	BLD #	PRODUCT	QTY(GAL/YR)
443 FMS Corrosion Control	291	Poly Paint	90
340 CAMS SAC Refurbishing	523	Thinner	12
340 CAMS SAC Refurbishing	523	Paint	36
443 CES Paint	356	Paint	180
443 CES Paint	356	Thinner	288
443 TRANS Allied Trades	353	Thinner	96
443 TRANS Allied Trades	353	Paint	36
		TOTAL:	738

Type of Waste: NDI CHEMICALS

SHOP	BLD #	PRODUCT	QTY(GAL/YR)
443 FMS NDI	450	Emulsifier	110
443 FMS NDI	450	Dye Penetrant	110
		TOTAL:	220

Type of Waste: RAGS

SHOP	BLD #	PRODUCT
443 FMS NDI	450	Rags
443 CES Paint	356	Rags
443 TRANS Allied Trades	353	Rags

340 CAMS SAC Refurbishing	523	Rags

APPENDIX F

Disposal Practices by Shop for Altus AFB

DISPOSAL PRACTICES BY SHOP FOR ALTUS AFB

SHOP: 340 CAMS SAC Refurbishing Building: 523

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Thinner	12	DH
Paint	36	DH
Rags	NQ	DH
TOTAL:	48	

SHOP: 443 ABG Auto Hobby Building: 343

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
PD-680	480	OWS
Motor Oil	360(	UGT
Aircraft Soap	780	OWS
Antifreeze	540	OWS
Safety Kleen	480	SBC
Motor Oil	60	OWS
Batteries	60	REC
Transmission Fluid	2400	UGT
TOTAL:	8400	

SHOP: 443 CES Paint Building: 356

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Thinner	288	DH
Rags	NQ	DH
Paint	180	DH
TOTAL:	468	

SHOP: 443 CES Power Prod Building: 347

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Battery Acid	120	NDD
Motor Oil	264	DNH

Aircraft Soap	24	DD
Rags	NQ	T
TOTAL:	408	

SHOP: 443 CES Refrigeration Building: 356

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Rags	NQ	BL
Refrig Oil	72	DNH
Motor Oil	24	DNH
TOTAL:	96	

SHOP: 443 FMS AGE Building: 506

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
PD-680	12	OWS
Hydraulic Fluid	120	DNH
Motor Oil	3000	DNH
Synthetic Oil	120	DNH
Rags	NQ	BL
Batteries	NQ	NDD
PD-680	20	DNH
Aircraft Soap	1320	OWS
TOTAL:	4592	

SHOP: 443 FMS Corrosion Control Building: 291

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Poly Paint	90	DH
Rags	NQ	T
MEK	90	DH
TOTAL:	180	

SHOP: 443 FMS NDI Building: 450

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL

Developer	110	DD
Rags	NQ	DH
X-Ray Developer	24	DD
X-Ray Fixer	24	SRDD
Dye Penetrant	110	DH
Fmulsifier	110	DH
Magnaglo	50	DNH
TOTAL:	428	

SHOP: 443 FMS Pneudraulics Building: 285

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
PD-680	660	DNH
Carbon Remover	NQ	REP
Hydraulic Fluid	1320	DNH
Rags	NQ	BL
TOTAL:	1980	

SHOP: 443 FMS Propulsion Branch Building: 0296

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Hydraulic Fluid	192	DNH
Carbon Remover	20	DH
Synthetic Oil	1752	DNH
Motor Oil	1752	DNH
PD-680	80	DNH
Aircraft Soap	660	OWS
Fingerprint Remover	20	DH
PD-680	660	OWS
TOTAL:	5136	

SHOP: 443 FMS Test Cell Building: 298

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Engine Oil	48	OWS

Engine Oil	72	DNH
Rags	NQ	BL
JP-4	72	OWS
TOTAL:	192	

SHOP: 443 OMS Jack Maintenance Building: 435

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Rags	NQ	BL
Hydraulic Fluid	36	DNH
TOTAL:	36	

SHOP: 443 OMS Wheel and Tire Building: 424

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Citrikleen	450	DNH
PD-680	300	DNH
NSN 8010-P9-201	400	DH
Rags	NQ	BL
TOTAL:	1150	

SHOP: 443 TRANS Allied Trades Building: 353

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
MEK	4	DH
Thinner	96	DH
Paint	36	DH
Rags	NQ	DH
TOTAL:	136	

SHOP: 443 TRANS Fire Truck Maint Building: 267

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Batteries	4	NDD
Rags	NQ	BL
Transmission Fluid	12	DNH

Motor Oil	360	DNH
Antifreeze	240	DNH
TOTAL:	616	

SHOP: 443 TRANS Refueling Maint Building: 392

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
JP-4	900	OWS
Motor Oil	480	DNH
TOTAL:	1380	

SHOP: 443 TRANS Special and General Purpoase Maint Building: 353

WASTE PRODUCT	QTY(GAL/YR)	DISPOSAL
Transmission Fluid	144	DNH
Hydraulic Fluid	720	DNH
PD-680	120	DNH
Motor Oil	1680	DNH
Aircraft Soap	240	OWS
Rags	NQ	BL
Batteries	216	NDD
Antifreeze	NQ	DNH
TOTAL:	3120	

LEGEND:
- BL - BASE LAUNDRY
- DD - DOWN DRAIN
- DH - DRUMMED AS HAZ WASTE
- NQ - AMT NOT QUANTIFIED
- T - MUNICIPAL TRASH
- UGT - UNDERGROUND TANK
- SRDD - SILVER RECOVERY THEN DOWN DRAIN
- REP - REPLENISHED
- OWS - OIL/WATER SEPARATOR
- DNH - DRUMMED AS NONHAZ WASTE
- REC - RECYCLED
- NDD - NEUTRALIZED THEN DOWN DRAIN
- SBC - SERVICED BY CONTRACTOR

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